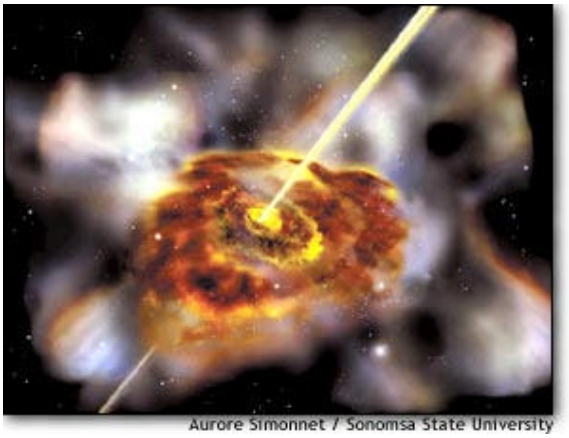
Detailed look at black hole's dinner



Aurore Simonnet / Sonomsa State University

An artist's conception of a black hole pulling in surrounding gas and dust. In this image, the black hole is buried in the center of a disk of gas and dust (brown and yellow cloudy area in center). This material whirls around the black hole before plunging in, like water down a drain. This generates intense friction, heating the gas and causing it to shine brightly.

By Robert Roy Britt
SPACE.COM

SEATTLE, Jan. 9 — Black holes love to feast. Among their favorite food is gas. Today, astronomers announced they've made the most detailed observations ever of giant clouds of gas very near a colossal black hole.

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ON THE BLACK HOLE'S DINNER PLATE was carbon monoxide. Some of it will almost surely be consumed, the researchers say. Scientists have struggled to observe these final stages of consumption, because black holes are far away and because the eating generates a lot of light that drowns out what's happening.

For this reason, the observations were made with a radio telescope.

"We have hints that some of the cold gas clouds may be moving toward the galactic center," said Johannes Staguhn, a radio astronomer at NASA and the Science Systems and Applications corporation.

Meanwhile, the cool gas, arranged in a ring around the center of a distant galaxy, is likely the site of some pretty incredible star formation, Staguhn said.

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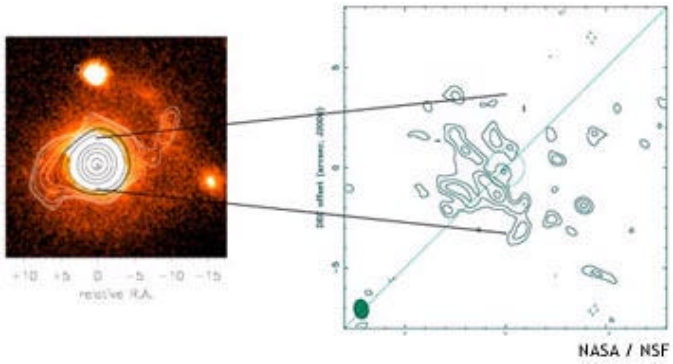
The findings, along with an artist's rendering of what the scene might look like, were released here today at a meeting of the American Astronomical Society

Staguhn and his colleagues studied a highly active galaxy, called a quasar, that is some 800 million light years away. Quasars shines fiercely. The new observations are a step toward determining if there is a link between star formation and the bright activity of quasars, which is thought to be generated when stuff falls into a supermassive central black hole.



The left is a composite of a Hubble infrared image (orange and white areas) of quasar galaxy QSO I Zw 1 overlaid with a contour-line image. White represents the highest intensity infrared light, orange-red represents the lowest. The right image is a more detailed portrayal of the galaxy's center.

The thinking goes like this: While some of the gas in the clouds collapses under its own weight to form stars, a portion of it leaks inward toward the black hole. The immense gravity of the black hole accelerates the gas to nearly the speed of light, superheating it and creating tremendous radiation before most of the gas is swallowed.

The gas clouds orbit about 4,000 light-years from the quasar's center, at a speed of nearly 125 miles every second (200 kps). They contain the mass of more than a billion suns.

The researches also found evidence that the quasar

might be interacting with a neighboring galaxy. Galaxy mergers are thought to fuel star formation, and Staguhn is eager to learn whether the same is true when quasars absorb other galaxies.

The observations were made with the National Science Foundation's Berkeley Illinois Maryland Association (BIMA) radio telescope array at Hat Creek, Calif.

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